

M.Sc. (Biotechnology) (CBCS Pattern) Second Semester CBCS
PSBIT-108 - Industrial Biotechnology Paper-IV

P. Pages : 1

Time : Three Hours



GUG/W/18/11194

Max. Marks : 80

Notes : 1. All questions are compulsory and carry equal marks.

1. Describe various types of fermentation with examples. **16**
- OR**
- a) Write a note on fed batch reactors. **8**
- b) Discuss design of fermentor. **8**
2. Describe in detail up stream processes in fermentation. **16**
- OR**
- Write note on;
- a) Raw materials used in fermentation. **8**
- b) Scale up. **8**
3. Describe ion exchange and affinity chromatography in down stream processing. **16**
- OR**
- Write note on:
- a) Counter current extraction. **8**
- b) Reverse Osmosis. **8**
4. Describe in detail industrial production of penicillin antibiotic. **16**
- OR**
- Write note on:
- a) Biosensor. **8**
- b) Immobilization of enzyme. **8**
5. Write short note on following.
- a) Fluidized bed reactors. **4**
- b) KLa value. **4**
- c) Solvent extraction. **4**
- d) Crystallization of products. **4**
